

Aphrodita bisetosa (Polychaeta: Aphroditidae), a new species of sea mouse from the southeastern Pacific Ocean off central Chile

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Abstract.—A new species of Aphroditidae, *Aphrodita bisetosa* from the southeastern Pacific Ocean off central Chile, is described. Specimens were collected in soft bottoms, 27–37 km from the coast line in front of Los Vilos (31°56'S) and Papudo (32°31'S), at 250–400 m depth. The new species was compared with *A. magellanica* Malard, 1891 from the Magellan area, Chile and *A. alta* Kinberg, 1855 from Rio de Janeiro, Brazil, and the Antarctic region, with which it appears to be more closely related.

Aphroditids are commonly named “sea mice,” because of the thick mat of very fine notopodial fibers which form a felt-like covering over the dorsum, giving them a furry appearance. Although they are rather large and conspicuous inhabitants of marine soft muddy bottoms, they are frequently absent from most collections because of the great depths at which they usually live, and in general they have been poorly studied. The most recent and comprehensive study of aphroditids was by Hutchings & McRae (1993) on species found in Australian waters and the Indonesian Archipelago.

There is almost no information about aphroditids of the southeastern Pacific Ocean along the Chilean coast. Only one species, *Aphrodita magellanica* Malard, 1891, has been previously recorded from the Magellan area (49°S) south to Cape Horn (56°S) in southern Chile (Rozbaczylo 1985); the specimens, had been collected during the Challenger Expedition (1873–1876), and identified by McIntosh (1885) as *Aphrodita echidna* Quatrefages.

Four specimens of aphroditids collected by commercial shrimp trawlers at two sites off central Chile were given to the first au-

thor for study; after examination, they were considered as belonging to a new species.

Materials and Methods

Specimens were collected by the shrimp-boat *Goden Wind*, as part of a benthic survey obtained 27–37 km from the coast between Los Vilos and Papudo, in October 1976. At 2 of 5 stations sampled, specimens of aphroditids were found in sandy-mud bottom (Fig. 1). Additional information on the accompanying macrofauna collected during the trawls can be found in Andrade (1986).

Polychaetes were fixed in 4% formalin and preserved in 70% ethanol. Figures were prepared with a drawing tube on a Wild M-5 stereoscopic microscope and a Leitz compound microscope.

Type specimens of the new species are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), and the Sala de Sistemática, Departamento de Ecología, Pontificia Universidad Católica de Chile, Santiago (SSUC).

Aphrodita bisetosa, new species

Figs. 1–3

Material examined.—Central Chile: in front of Los Vilos, St. 1, ca. 31°56'S, 71°49'W, 300–400 m, H. Andrade, coll., 14 Oct 1976, holotype (USNM 186512) and female paratype (SSUC 6868); in front of Papudo, St. 3, ca. 32°31'S, 71°47'W, 250–280 m, H. Andrade, coll., 14 Oct 1976, paratype (N° 2 USNM 186513) and female paratype (SSUC 6869).

Description.—Holotype. Body ovate, arched dorsally, widest at setigers 14–16, with tapering caudal region (Fig. 2a); 27 mm long, 16 mm wide, excluding setae, with 41 setigers. Dorsum with thick felt, approximately 1.5 mm thick at middle region of body, with fine sediment entrapped giving it greyish appearance. Ventral surface of body whitish, covered with minute spherical papillae (Fig. 2d).

Prostomium small, rounded with pair of ocular areas, pale to light brown in color, located on slightly raised prominences (Fig. 2b). Median antenna with basal ceratophore and elongated style, slightly shorter than prostomium, attached dorsally, near anterior border of prostomium. Palps biarticulate, finely papillated, wide basally, tapering gradually, extending approximately to sixth setiger. Facial tubercle minutely papillated, approximately half of length of prostomium, partly hidden by palps dorsally and extending ventrally as digitiform process over mouth (Fig. 2b, c).

Elytra (Fig. 2e, f) 15 pairs, completely hidden by dorsal feltage, on setigers 2, 4, 5, 7, 9, . . . 25, 28, 31, imbricate, completely covering dorsum, semi-transparent; smooth except for few scattered microscopic digitiform papillae (Fig. 2g), mostly concentrated on inner lateral area of upper surface and less on posterior area of elytra. First pair of elytra smallest, gradually increasing in size to approximately pair 7–9, then decreasing posteriorly. First and second pair of elytra ovate, longer than wide, with elythrofores attached centrally and lat-

erally, respectively; following elytra wider than long; last three pairs noticeably longer than wide; last pair smaller.

Dorsal tubercles from segment 6 to 30 provided with branched fimbriated papillae on posterolateral margins (Fig. 3d).

First setiger or tentacular segment with elongated, uniramous parapodia, flattened, projecting anteriorly and laterally to prostomium (Fig. 2b), with one tuft of fine silky fibers emerging dorsally forming the dorsal felt, and 3 fascicles of fine, faintly iridescent, mud-covered capillary setae; one tuft supra-acicular and two others sub-acicular; with few scattered papillae covering parapodium (Fig. 2b). Parapodial dorsal and ventral cirri with cylindrical cirrophores and subulate styles. Dorsal cirri approximately one-third length of palps. Ventral cirri slightly shorter than dorsal.

Following setigers with biramous parapodia. Second setiger with first pair of elytra. Notopodia rectangular, with one tuft of fine silky fibers forming dorsal felt, 2 supra-acicular fascicles of stout acicular setae, with hooked tips, similar in shape and distribution to that of parapodium 3, and a sub-acicular fascicle with capillary notosetae forming lateral fringe, and on posterior surface of notopodia at level of acicula, a small tuft of fine silky fibers forming dorsal felt. Neuropodia cylindrical, covered with spherical papillae; tip of acicula emerging at distal end of neuropodial lobe. Neurosetae, brown, arranged in 3 tiers: upper consisting of 2–3 acicular setae, middle 1–2 acicular setae, and lower of numerous capillary setae (Fig. 31), slender bipinnate and spirally twisted, with two rows of thick teeth that continue in subdistal region as fine spines, and with distal end smooth. Ventral cirri subulate, located near base of neuropodium, about one and one-half length of neuropodia (Fig. 2d).

Third setiger similar to second, but with dorsal cirri instead of elytra. Dorsal cirri long, subulate, approximately 3–4 times length of ventral cirri.

Parapodia of middle region of body (Fig.

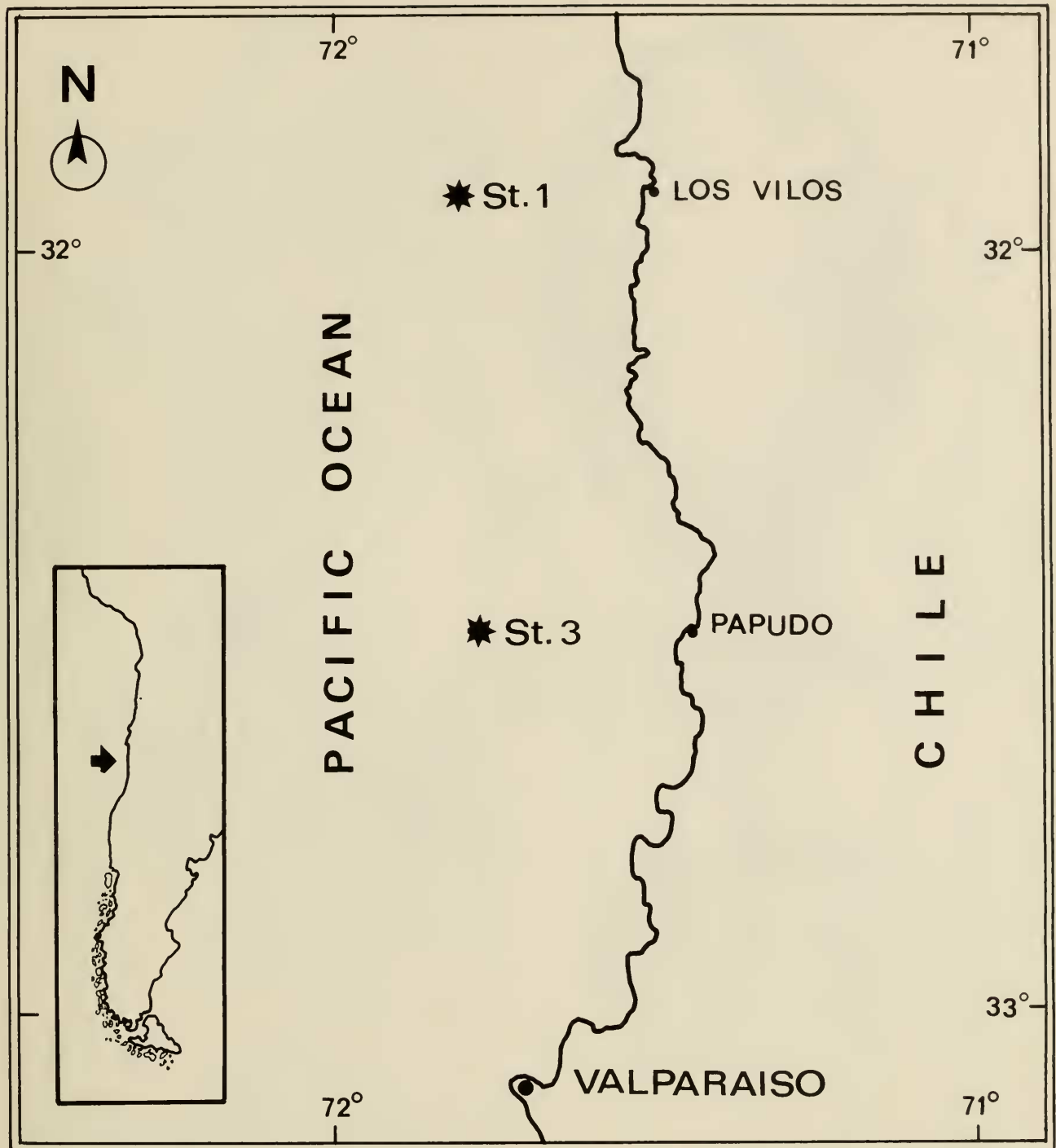


Fig. 1. Map showing the stations (*) where specimens of *Aphrodita bisetosa*, new species, were found.

3a, b) with notopodial lobe large, nearly triangular, with dorsal cirri with cirrophores large, basally bulbous, projecting on posterior faces of notopodia; styles subulate, long, slender, smooth, directed dorsally; dorsal cirri approximately 3–4 times longer than ventral cirri; notoacacula stout, light brown, emerging at vertex of distal end of notopodial lobe.

Notopodia with tufts of fine silky fibers emerging dorsally forming dorsal felt, with

hooked ends (Fig. 3i); arranged in three main groups on cirriferous segments, one above and one below upper fascicle of supra-acicular notosetae, and third one on posterior surface of notopodia at level of acicula; on elytrigerous segments appearing in two main groups, one between upper and lower fascicle of long supra-acicular notosetae, and one on posterior surface of notopodia at level of acicula. Three fascicles of notosetae present, one sub-acicular and

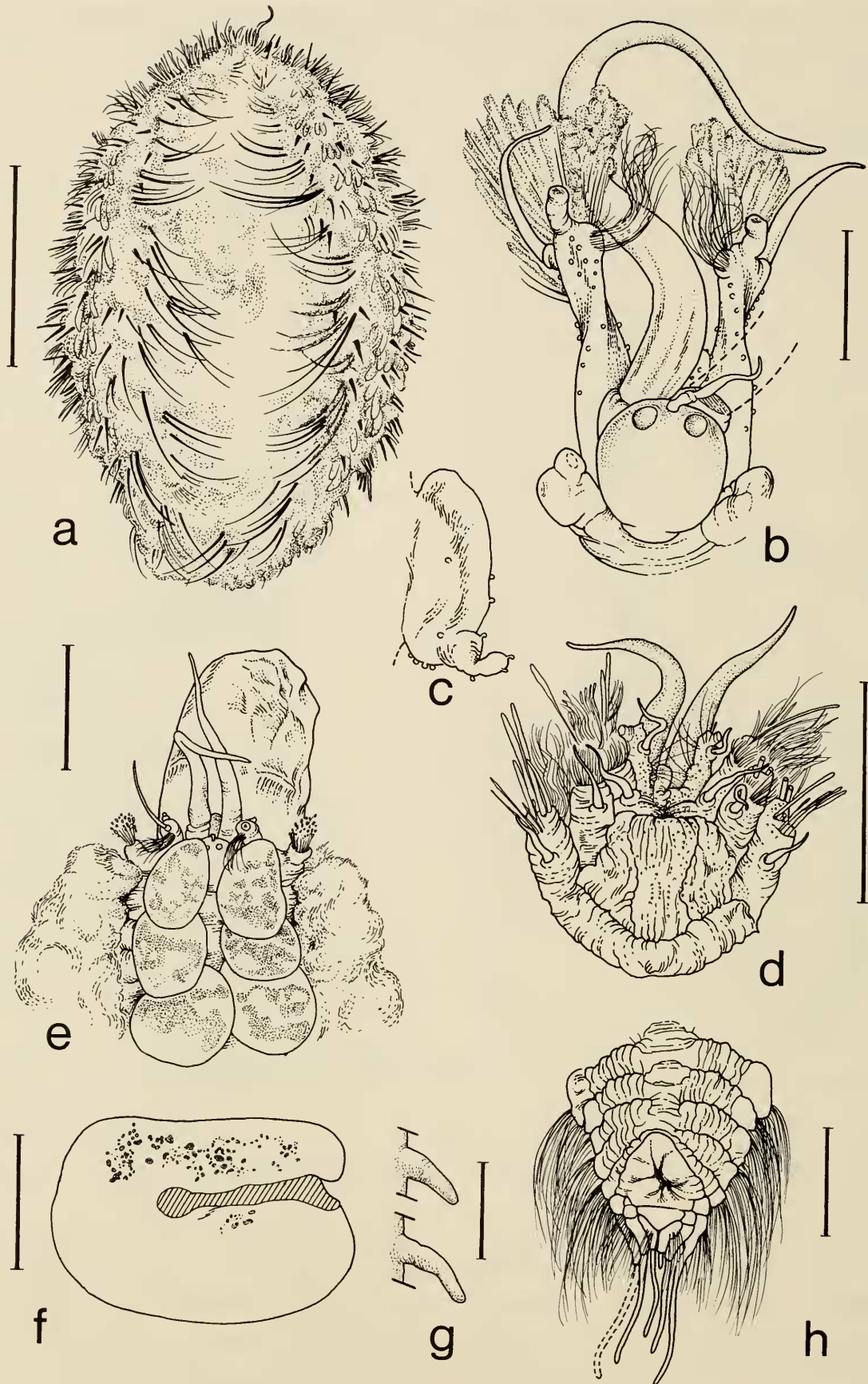


Fig. 2. *Aphrodita bisetosa*, new species (Holotype USNM 186512). a, dorsal view, whole animal; b, dorsal view of prostomium and first segment, with first pair of elytra omitted (right palp and dorsal parapodial cirri missing); c, facial tubercle (Paratype SSUC 6869), antero-lateral view; d, anterior end (Paratype SSUC 6869), ventral view; e, anterior end (Paratype USNM 186513), dorsal view, with proboscis everted and feltage setae aside, showing first three pairs of elytra, style of median antenna missing; f, ninth left elytron, inner surface (Paratype USNM 186513); g, papillae from ninth elytron; h, posterior segments around the anus (Paratype SSUC 6869), dorsal view. Scales = 10 mm for a; 5 mm for d, e, f; 1 mm for b, h; 0.05 mm for g.

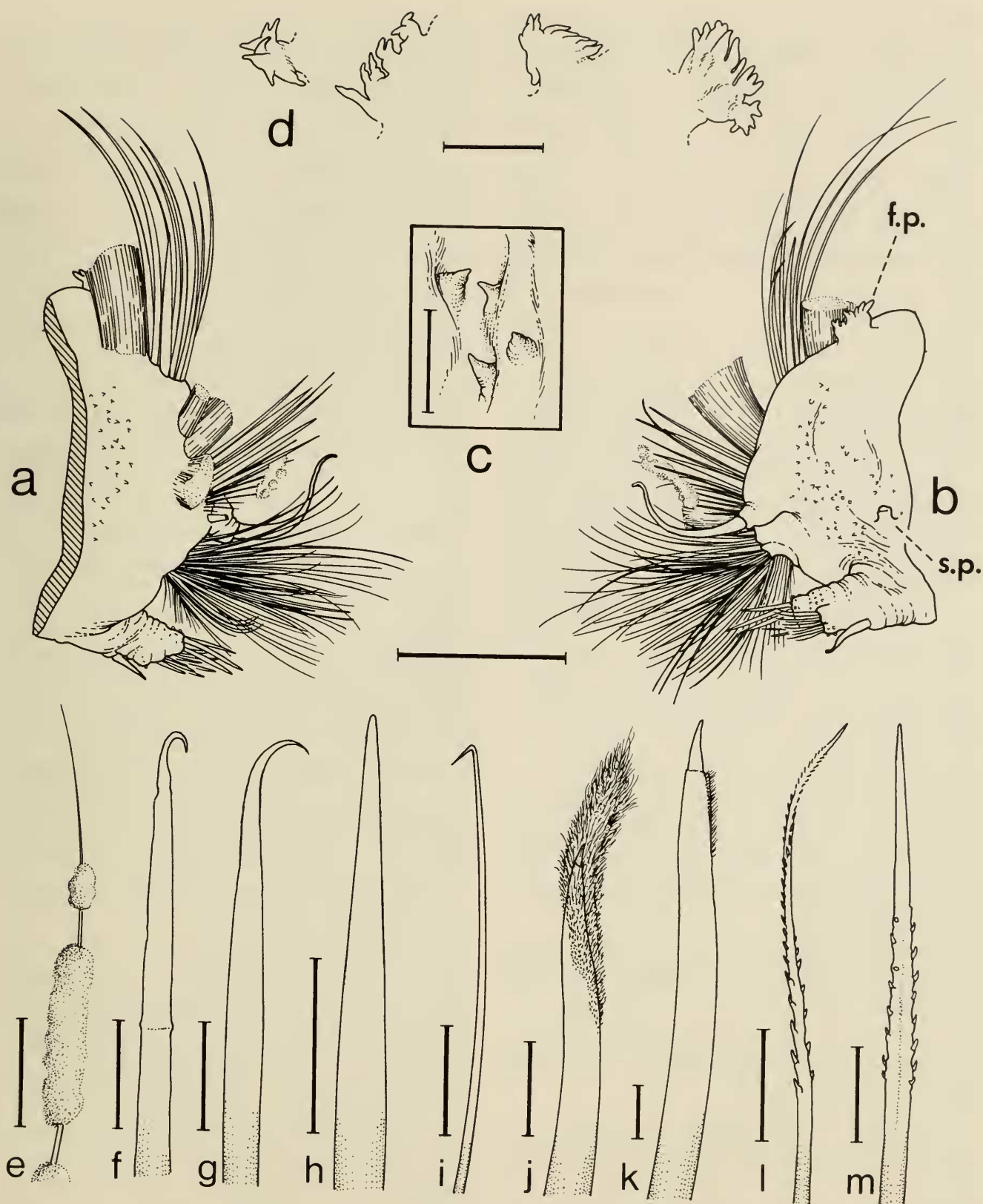


Fig. 3. *Aphrodita bisetosa*, new species, a, parapodium 14 (Paratype SSUC 6868), in anterior view (tufts of silky fibers are shown cut off); b, same parapodium in posterior view (f. p. = fimbriated papilla; s. p. = segmental papilla); c, conical papillae from notopodium of same parapodium; d, fimbriated papillae (Paratype SSUC 6869), from segments 6, 8, 10, and 12, respectively; e, capillary notoseta from parapodium 14; f, g, acicular notosetae of stout type, with hooked tips, from parapodium 14; h, acicular notoseta of stouter type, with straight tip, from parapodium 18; i, fine silky fiber, from parapodium 20; j, acicular neuroseta, with heavily bearded end, from lower tier, parapodium 22; k, acicular neuroseta, partially bearded, from lower tier, parapodium 14; l, capillary bipinnate neuroseta, spirally twisted, from lower tier, parapodium 2; m, capillary, partially bipinnate neuroseta, from lower tier, parapodium 29. Scales = 5 mm for a, b, j; 1 mm for d, h; 0.5 mm for c; 0.01 mm for k, l, m; 0.005 mm for e, f, g, i.

two supra-acicular. Sub-acicular fascicle made up of numerous iridescent capillary setae (Fig. 3e), extending laterally, with distal end straight and pointed; most covered with fine silky fibers and fine mud resembling cotton in appearance. Two supracicular fascicles made up of 2 kinds of acicular setae emerging through dorsal feltage: many stout acicular setae with hooked tips (Fig. 3f, g) and 1–2 stouter acicular setae with straight tips (Fig. 3h), short, conical, dark brown to blackish, spine-like, extending dorso-posteriorly (tips may be broken off), with fine silky fibers at base. In upper fascicle, stout protective notosetae present (Fig. 2a), long, brown-colored basally and shiny golden light brown color distally, tapering gradually, with flexible hooked tips (may be broken off), sometimes partially covered with fine silky fibers. In lower fascicle, stout protective notosetae short with, distal region having fine silky fibers and covered with fine mud presenting finger-like appearance, peppered with ferruginous color.

Notopodia covered with two kinds of papillae: globular, small, few, scattered on subacicular area near distal margin of notopodial lobe, and conical (Fig. 3c), larger and more abundant, scattered on basal area of notopodial lobe.

Neuropodia (Fig. 3b), cylindrical, ending distally in three step-like lobes, covered with minute spherical papillae. Ventral cirri small, subulate, located in middle region of neuropodia, approximately one-third the length of dorsal cirri.

Neurosetae stiff, stout, dark brown, slightly curved distally, with heavily bearded ends (Fig. 3j), which can be broken; pointed subdistal tip visible through beard, exposed when the distal tip of beard ends lost (Fig. 3k). Neurosetae arranged in three tiers with 2 setae in upper, 2 in middle and 4–6 in lower tier in anterior parapodium (setiger 4), 2 in upper, 3–4 in middle and 5–9 in lower tier in middle parapodium (setiger 15), and 2 in upper, 2 in middle and 7 in lower tier in parapodium of posterior

region of body (setiger 25). Upper group with stoutest and longest setae; lowest most slender and shortest. Neuroacicula, stout, light brown, emerging through upper lobe.

Ventral neurosetae of posterior region of body, capillaries, with two rows of teeth subdistally (Fig. 3m), and distal region smooth with tips from slightly curved to straight. Neurosetae of more posterior setigers all capillaries.

Anus (Fig. 2h) located dorsally, anterior to 2 small segments. Without anal cirri.

Variation.—Additional material examined ranges from 47–80 mm long, 20–35 mm wide, excluding setae, with 42 setigers. Body varies from ovate to elongated in largest specimens. Fascial tubercle extends ventrally as digitiform process over mouth in all except one specimen (paratype SSUC 6868). Only one specimen with everted proboscis (Fig. 2e) with opening surrounded by numerous, leaflike, dichotomously branched papillae; chitinous jaws lacking. Elytra in largest specimens are light brown to cream in color; irregularly stained ferruginous to olive in colour on inner surface (Fig. 2f). Holotype without segmental papillae, but present in largest specimens as small knobs on posterior faces of parapodia between rami, on segment 14, and subsequent setigers (Fig. 3b).

In paratypes neurosetae varied as follows: 2 setae in upper, 2–3 in middle and 3–6 in lower tier in anterior parapodium (setiger 4), 2–3 in upper, 3–5 in middle and 10–12 in lower tier in middle parapodium (setiger 15), and 2–3 in upper, 3–4 in middle and 7–11 in lower tier in parapodium of posterior region of body (setiger 25).

Etymology.—The species name *bisetosa* is derived from Latin *bi*-meaning double, and *setosa* meaning with bristles, because of the presence of two kinds of notosetae which emerge through the dorsal feltage.

Distribution.—The species has been found at two sites off Central Chile: between 27 and 37 km off the coast in front of Los Vilos, 300–400 m and in front of Papudo, 250–280 m depth, in sandy-mud bottoms.

Remarks.—The new species *Aphrodita bisetosa* is characterized by two kinds of acicular setae emerging through dorsal feltage: numerous stout setae with hooked tips, and some stouter, short, dark brown, spine-like setae, with straight tips, forming two distinct rows of protective notosetae along each side of body. The acicular notosetae appear in two fan-shaped fascicles of different length: an upper fascicle of long setae, shiny golden brown-colored distally, extending dorsomedially, nearly touching medially, and a lower fascicle of short setae extending backwards, bearing a mud cover, peppered with ferruginous colour, presenting finger-like appearance.

Aphrodita bisetosa appears to be most closely related to *A. magellanica* Malard, 1891, from the Magellan area and to *A. alta* Kinberg, 1855 from Rio de Janeiro, Brazil, and the Antarctic region. *A. magellanica* is the most similar to *A. bisetosa* n. sp. Both species have two rows of acicular notosetae along each lateral region of the body that are short, brown, and spine-like with straight tips emerging through the dorsal feltage. Both species have similar neurosetae of the acicular type, brown, with bearded ends (which can be broken), and in both species the dorsal felt is formed of very fine silky fibers with hooked tips; the lateral regions are of ferruginous color. *A. bisetosa* differs from *A. magellanica* by having two kinds of protective notosetae; its spine like acicular notosetae are conical toward the tip, 1–2 of these notosetae are present in each supracircular tuft; ventral cirri of parapodia lack papillae; and the body has 41–42 setigers. In *A. magellanica*, in contrast, has only one kind of protective notosetae. The spine like notosetae are flattened toward the tip, 2–3 of these notosetae can be present in each supracircular tuft; ventral cirri of parapodia possess numerous papillae and the body has about 35 segments.

Aphrodita bisetosa resembles *A. alta* in that the protective notosetae end in a hook, the acicular neurosetae of the middle region of the body are slightly curved and have

heavily bearded ends and in both species the proboscis bears leaflike papillae surrounding the opening. *A. bisetosa* differs from *A. alta* by the following characteristics present in the latter species: only one type of protective notosetae that do not project through the felting, only one type of ornamentation in capillary neurosetae of second setiger; without segmental papillae and proboscis with jaws.

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